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INFLUENZA IN CANADA — 1995-1996 SEASON

Each year, from October to the following May, the Laboratory Centre for Disease Control (LCDC) maintains a national surveillance program for influenza. This program is supported by laboratories, and provincial and territorial epidemiologists who exchange information on cases, laboratory identifications, and outbreaks. During the 1995-1996 season, surveillance activities included the collection of weekly aggregated reports of virus identifications by laboratories via an interactive voice response system. Participating laboratories submitted detailed case-by-case reports of laboratory-confirmed infections, and provincial and territorial health departments provided weekly assessments of influenza-like illness (ILI) activity in the community.

Weekly summaries of influenza surveillance data were made available via FAX*link* and included tabulated details of isolations by laboratories as well as graphic representation of reporting trends. In addition, weekly summaries of influenza activity worldwide, particularly in North America and Europe, were included in the weekly *News Brief* sent to provincial and territorial epidemiologists, and laboratory directors. Short surveillance reports on respiratory virus activity, including influenza, were included periodically in the *Canada Communicable Disease Report* (CCDR).

This report summarizes case-by-case data on laboratory-confirmed influenza infection and reports of influenza-like illness for the 1995-1996 season. Comparison is made with the previous four seasons: 1991-1992, 1992-1993, 1993-1994, and 1995-1996[1-4].

Methods

Laboratories participating in the surveillance program were asked to report isolations and identifications made by direct antigen detection and seroconversion, i.e. ≥ four-fold rise in titre by any method. Data for laboratory-confirmed cases are presented by the province from which the specimen originated (some laboratories received out-of-province samples) and were analyzed by week of onset of illness and the age of the case.

Provincial and territorial epidemiologists reported weekly on the presence and level of ILI in the community. This was assessed at one of four levels — no reports of influenza-like illness, sporadic cases, localized outbreaks, and widespread outbreaks. Criteria for describing categories may have varied between jurisdictions making direct comparisons difficult; however, the purpose of collecting the information was primarily to obtain a timely indication of the extent of illness in the community.

Laboratory-confirmed influenza

During the 1995-1996 influenza surveillance period (week ending 21 October 1995 to week ending 1 June 1996), 10 laboratories in eight provinces reported a total of 1,075 cases to LCDC (Table 1). This compares with 1,431 cases reported by 17 laboratories in the same eight provinces for the previous season (1994-1995). The variation in numbers of confirmed cases and virus distribution between provinces should be interpreted with caution. The figures are likely to reflect differences in reporting practices, criteria, availability of diagnostic services as well as population size and distribution.

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Table 1
Laboratory-confirmed cases of influenza reported to LCDC by laboratory, Canada, 1995-1996

Province	Laboratory	Number of Cases
Nova Scotia	Victoria General Hospital, Halifax	10
Prince Edward Island	Queen Elizabeth Hospital	4
Quebec	*Laboratoire de sante publique du Québec*, Sainte-Anne-de-Bellevue	177
Ontario	Kingston Public Health Laboratory	40
	Central Public Health Laboratory	182
Manitoba	Cadham Provincial Laboratory, Winnipeg	147
Saskatchewan	Saskatchewan Department of Health, Regina	167
Alberta	Provincial Laboratory of Public Health for Northern Alberta, Edmonton	128
	Provincial Laboratory of Public Health for Southern Alberta, Calgary	107
British Columbia	Division of Laboratories, Health Branch, Vancouver	113
TOTAL		1,075

Table 2 shows the number and type of virus identified by province. Although reports of both type A and type B virus were recorded, the majority of isolates (920; 86%) were of type A virus. Influenza B virus accounted for the remaining (155; 14%) confirmed infections. This was less than half the total of 365 influenza B virus reports recorded the previous season. A detailed description of the strains characterized in the 1995-1996 season is published in the previous CCDR[5].

Totals of laboratory-confirmed cases are shown by week for five regions — Atlantic Canada, Quebec, Ontario, the Prairies, and British Columbia (Figure 1). The earliest confirmed cases were recorded in the Prairie provinces in early to mid-October, 4 to 6 weeks before the other regions. The largest number and proportion of cases (548; 51%) were also recorded in the Prairies. This was the only region to show a prominent peak in reporting, which occurred in early December 1995. Elsewhere, reporting began in December and in Quebec in early November. With the exception of one case in December in Ontario, all reports with an onset date in 1995 were of the influenza A type. Influenza B virus reports were recorded from January 1996 and accounted for the majority of recorded cases from March 1996 onwards. Reporting continued until early May in Ontario, and sporadic cases of influenza A and B viruses were recorded in the Prairie provinces up to the beginning of June.

The distribution of cases by age indicated that most laboratory-confirmed infections were recorded in children aged < 10 years (49%). This is an increase when compared with the previous two seasons — 28% (1993-1994) and 42% (1994-1995) respectively in this age group. There was also a decline in the proportion of cases aged 45 to 64 years (8%) and > 64 years (8%) when compared with the previous season (Figure 2).

Method of laboratory confirmation

Virus isolation (788 cases; 73%) and direct antigen detection (176 cases; 16%) were the most commonly reported methods for laboratory confirmation of influenza infection. The remaining cases (111 cases; 10%), for which information was available, were confirmed by serology. This distribution compares with 72% of confirmations made by virus isolation, 19% by direct antigen detection, and 9% by serology in the previous season. The majority of confirmations in young children aged < 5 years (99%), in those aged 5 to 44 years (86%), and in adults aged ≥ 44 years (75%) were by virus isolation or direct antigen detection.

Types of influenza virus in circulation during the 1995-1996 season

Figure 3 shows the distribution, over time, of virus identifications reported to LCDC. The 1995-1996 influenza season had

Table 2
Laboratory-confirmed cases of influenza by province, and influenza type and subtype, Canada, 1995-1996

Influenza Type	NFLD	PEI	NS	NB	QUE	ONT	MAN	SASK	ALTA	BC	TOTAL
TYPE A Not subtyped	—	4	8	2	170	148	110	27	119	73	661
H_1N_1	—	—	—	—	—	8	—	115	94	18	235
H_3N_2	—	—	—	—	—	1	1	2	10	10	24
Total A	—	4	8	2	170	157	111	144	223	101	920
TYPE B	—	—	—	—	7	65	35	23	12	13	155
TOTAL	—	4	8	2	177	222	146	167	235	114	1075

Figure 1
Laboratory-confirmed cases of influenza by region, type, and week of onset, Canada,1995-1996

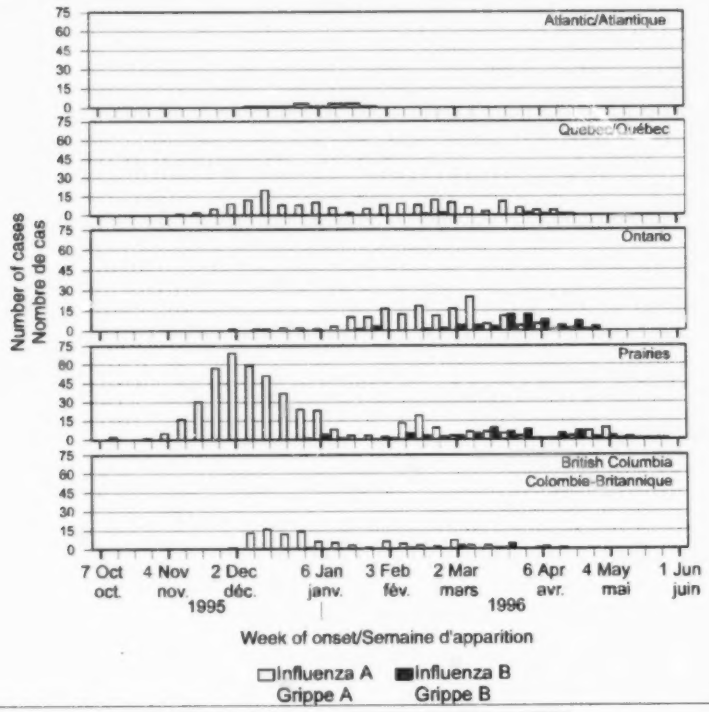
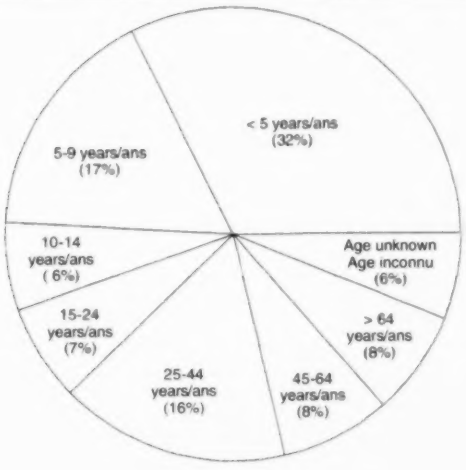


Figure 2
Proportionate distribution of laboratory-confirmed cases of influenza by age group, Canada, 1995-1996



three distinct phases. The earliest reports were of confirmed influenza in individuals with onset of illness in the second half of October 1995. Influenza A virus predominated during the early part of the season. Two distinct peaks in the reporting of influenza A virus were recorded. The earliest and greatest peak occurred in the second half of December 1995. A second, smaller peak occurred in late February 1996. Influenza B virus reports peaked at the end of March and the beginning of April, although sporadic cases were recorded in December and January. Sporadic cases of both virus types continued to be recorded to the beginning of June.

The 1995-1996 influenza season is compared with the previous four seasons in Figure 4. As in the previous season, there was moderate reporting of influenza B virus. However, the number of influenza B virus reports received was about half the total recorded in 1994-1995, and significant reporting occurred late in the season.

The most common influenza A strains recorded during the 1995-1996 season were A/Texas/36/91(H1N1)-like and A/Johannesburg/33/94 (H3N2)-like. In the latter part of the season, the predominant influenza B strain was B/Beijing/184/193-like[5].

Influenza-like illness activity

The extent of ILI activity was reported, weekly, by provincial and territorial epidemiologists. Information was received from six jurisdictions, of which only three reported consistently for the duration of the influenza season. Criteria for describing the extent of ILI in the community may vary between jurisdictions, making direct comparisons difficult. Nevertheless the trends reported generally corresponded with laboratory reporting of confirmed influenza. Thus, greatest ILI activity was recorded in Alberta and Saskatchewan in November and December 1995, whereas peak activity was recorded between January and March for the remaining reporting provinces. Two provinces reported localized outbreaks of ILI (Newfoundland and Ontario) and three reported widespread outbreaks (Alberta, Prince Edward Island, and Saskatchewan).

Discussion

In keeping with trends observed in recent years, the 1995-1996 influenza season was characterized by moderate activity in Canada. The number of laboratory reports was the lowest since 1990-1991 (1,052) and probably reflected lower participation in the program by laboratories. Only nine laboratories reported confirmed influenza compared with an average of 17 laboratories in each of the previous four seasons.

Reporting trends in 1995-1996 were unusual compared to the previous four seasons. A double peak in reporting was clearly associated with influenza A activity in the Prairie provinces in late autumn 1995, and then in other regions in early 1996. Although lower than in 1994-1995, influenza B virus reporting was significant in the period April to June 1996. This went against the previous pattern of significant influenza B reporting in alternate seasons. However, trends in Canada were generally similar to those observed in the United States and Europe. In the United States, influenza activity peaked in late December 1995 to early January 1996. Early activity was predominantly due to influenza A (H3N2 and H1N1 subtypes) whereas significant reporting of influenza B began to increase in February 1996. In Europe, influenza activity was highest between December 1995 and February 1996, and was largely associated with influenza A (H3N2 and H1N1 subtypes) activity. Influenza B virus activity occurred sporadically.

A physician-based, nation-wide sentinel reporting system was piloted by LCDC during the 1995-1996 influenza season. The program was designed to collect weekly reports of ILI from at

Figure 3
Laboratory-confirmed cases of influenza by type and week of onset, Canada,1995-1996

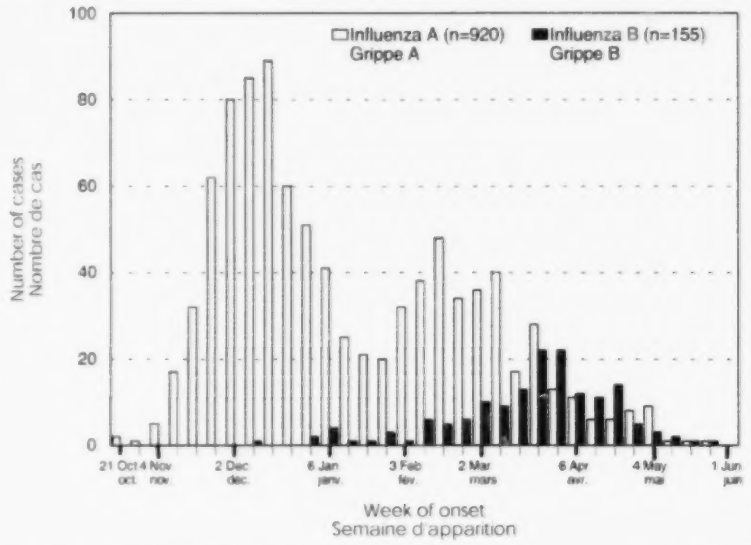
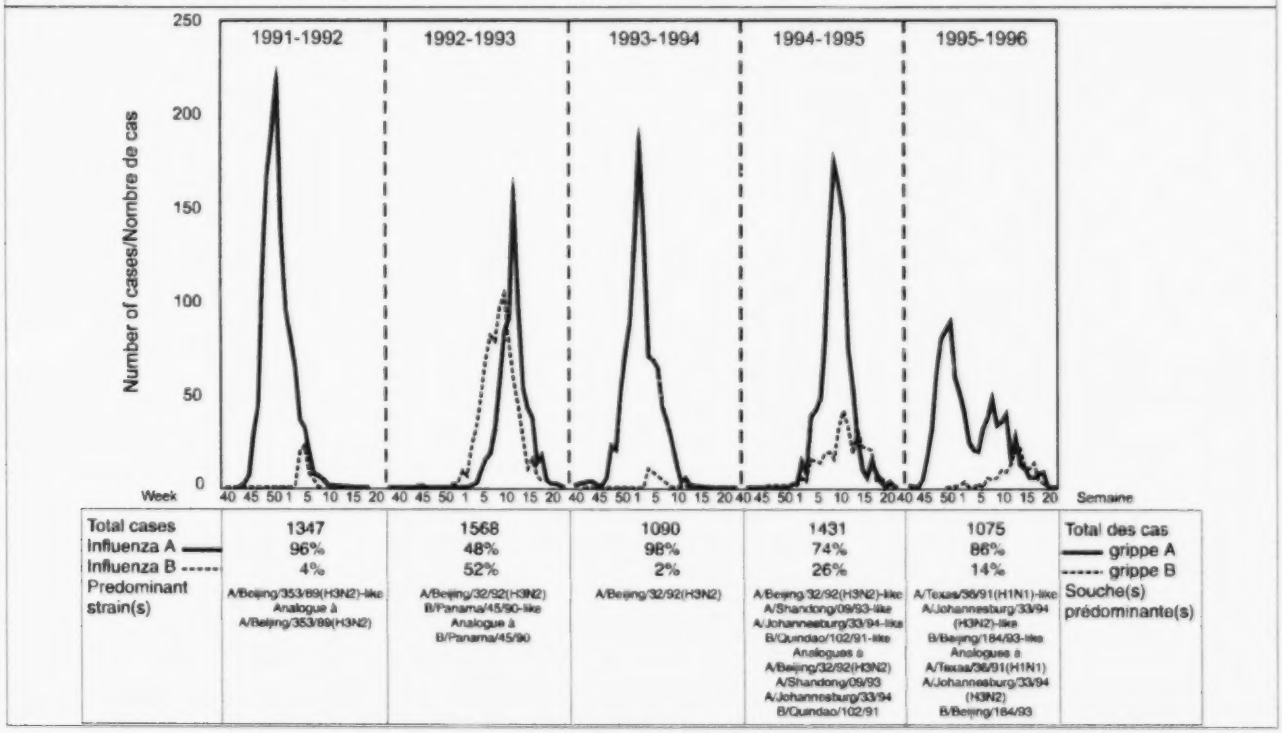


Figure 4
Seasonal distribution of laboratory-confirmed influenza infections, Canada, 1991-1996



	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	
Total cases	1347	1568	1090	1431	1075	Total des cas
Influenza A ——	96%	48%	98%	74%	86%	—— grippe A
Influenza B ------	4%	52%	2%	26%	14%	------ grippe B
Predominant strain(s)	A/Beijing/353/89(H3N2)-like Analogue à A/Beijing/353/89(H3N2)	A/Beijing/32/92(H3N2) B/Panama/45/90-like Analogue à B/Panama/45/90	A/Beijing/32/92(H3N2)	A/Beijing/32/92(H3N2)-like A/Shandong/09/93-like A/Johannesburg/33/94-like B/Quindao/102/91-like Analogues à A/Beijing/32/92(H3N2) A/Shandong/09/93 A/Johannesburg/33/94 B/Quindao/102/91	A/Texas/36/91(H1N1)-like A/Johannesburg/33/94 (H3N2)-like B/Beijing/184/93-like Analogues à A/Texas/36/91(H1N1) A/Johannesburg/33/94 (H3N2) B/Beijing/184/93	Souche(s) prédominante(s)

least one family physician per census district across Canada. Physicians were asked to record, 1 day each week, numbers of consultations by age group and numbers of cases fulfilling the program case definition for ILI. This data was then passed to the FLUWATCH program at LCDC for analysis. Although the program began too late in the season to contribute meaningful information to last year's surveillance activities, it demonstrated the feasibility of collecting standardized national data on a regular basis which could contribute to timely surveillance of ILI activity in the community. On this basis, it is intended that a modified scheme be implemented during the 1996-1997 season.

The influenza surveillance program is designed to monitor the occurrence and severity of influenza activity in Canada, and to provide information on circulating viruses for planning and control purposes. Information derived from the surveillance program is made available weekly as summary reports and in monthly respiratory disease surveillance articles in the CCDR. The weekly reports can be obtained by dialling the LCDC FAX*link* number (613-941-3900) from a telephone-equipped fax machine. Laboratories wishing to participate in the surveillance program should contact Mr. Peter Zabchuk, Division of Disease Surveillance, Bureau of Infectious Diseases, LCDC, (613-952-9729).

Acknowledgements

We would like to thank the staff of the laboratories who participated in the respiratory virus surveillance program during the 1995-1996 season, and Dr. John Weber, formerly of the Laboratory for Surveillance, Influenza and Viral Exanthema, LCDC, for information regarding typing of virus strains. We also wish to express our thanks to provincial and territorial epidemiologists for providing information about the extent of influenza-like illness in their jurisdictions. Finally, we wish to thank all the physicians who contributed to the FLUWATCH pilot program in association with the College of Family Physicians of Canada, National Recording System, and the sentinel influenza surveillance programs in British Columbia and Calgary, Alberta.

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Source: *Division of Disease Surveillance, Bureau of Infectious Diseases, LCDC, Ottawa, Ontario.*

International Notes

ENTEROHEMORRHAGIC *ESCHERICHIA COLI* INFECTION — JAPAN

Updated information has been obtained on the outbreak of enterohemorrhagic *Escherichia coli* (EHEC) infection in Sakai City in July 1996. The outbreak affected a total of 6,309 school-children and 92 school staff members from 62 municipal elementary schools. Another 160 people, mainly family members of infected schoolchildren, contracted secondary infections. Since 8 August, no new cases have been reported. The number of hospitalized patients peaked at 534 on 18 July and had decreased to 31 by 26 August. The number of patients suffering from hemolytic uremic syndrome peaked at 101 on 24 July. Two, a 10-year-old girl and a 12-year-old girl, had died by 26 August. *E. coli* serotype O157:H7 was commonly detected in patients' stool samples.

The epidemiologic investigation revealed that fresh radish sprouts were among the foods eaten in common by the schoolchildren. Radish sprouts, which are popularly eaten raw in Japan, were served in school lunches either on 8 or 9 July, depending on the school. In another outbreak which occurred also in July 1996 in a home for the elderly in Habikino City (98 people affected) and in three other small outbreaks in the nearby region, radish sprouts also produced by the same farm were identified to have been consumed. The DNA patterns of *E. coli*, analysed by the National Institute of Health, Japan, were identical among the isolates from the five outbreaks. However, samples of radish seeds and sprouts, water, and soil from the environment of the farm concerned and stool samples from the farm workers showed no trace of this organism.

As of 26 August 1996, a total of 9,578 cases of *E. coli* serotypes O157:H7 and O157:H- infection, including both outbreaks and sporadic infections, had been reported in Japan this year, resulting in 11 deaths. Although most of the cases are believed to be foodborne, the responsible foods have not been identified with certainty except for a few isolated cases. The analysis of DNA patterns of the isolates from various sources suggests a heterogenous origin of contamination. A report on the outbreaks of EHEC infection is available in the Infectious Agents Surveillance Report from the National Institute of Health, Japan. The Government of Japan is continuing its investigation and has been putting in place a number of preventive measures, with emphasis on guidance and verification to ensure hygienic practice in mass catering facilities in schools as well as other food-handling establishments.

Source: *WHO Weekly Epidemiological Record, Vol 71, No 35, 1996.*